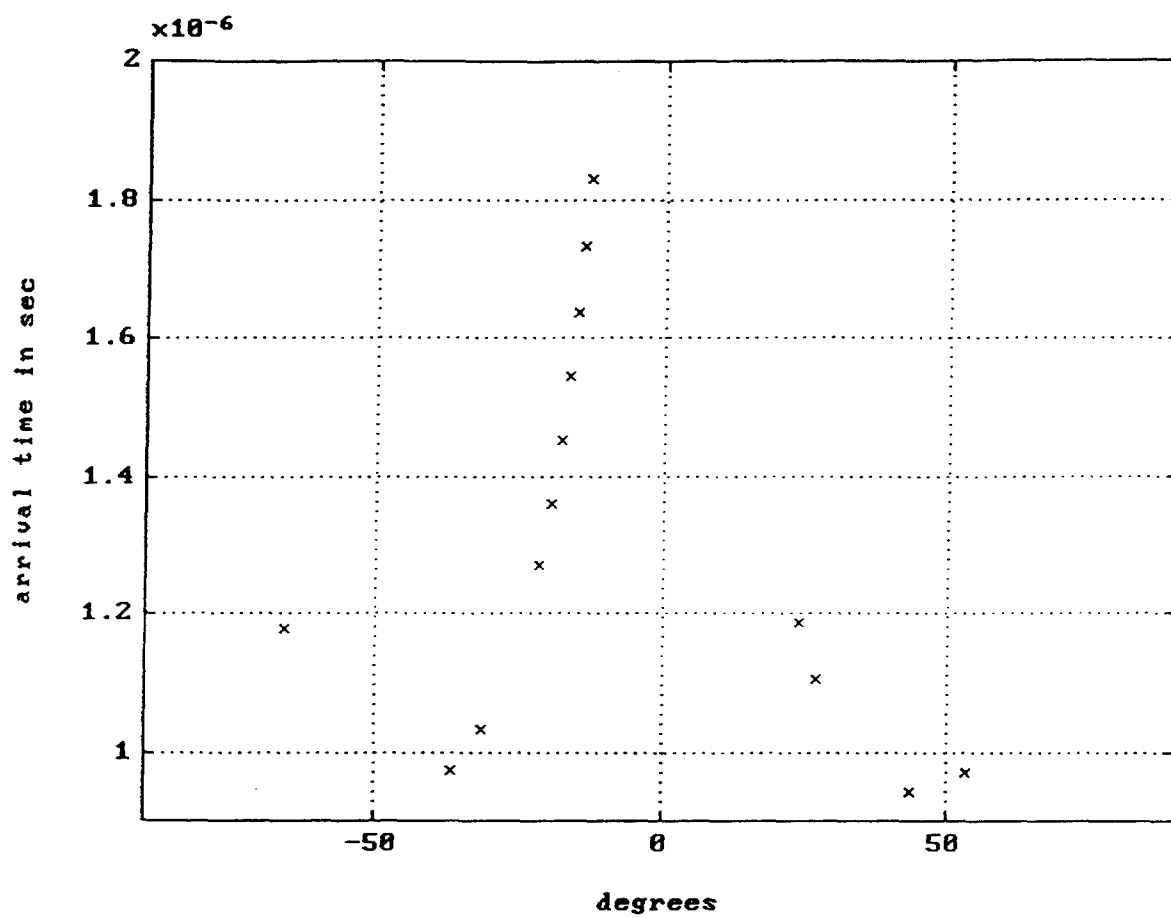


$d_1 = 100$  meters

$d_2 = 100$  meters

**FIGURE 4.8**



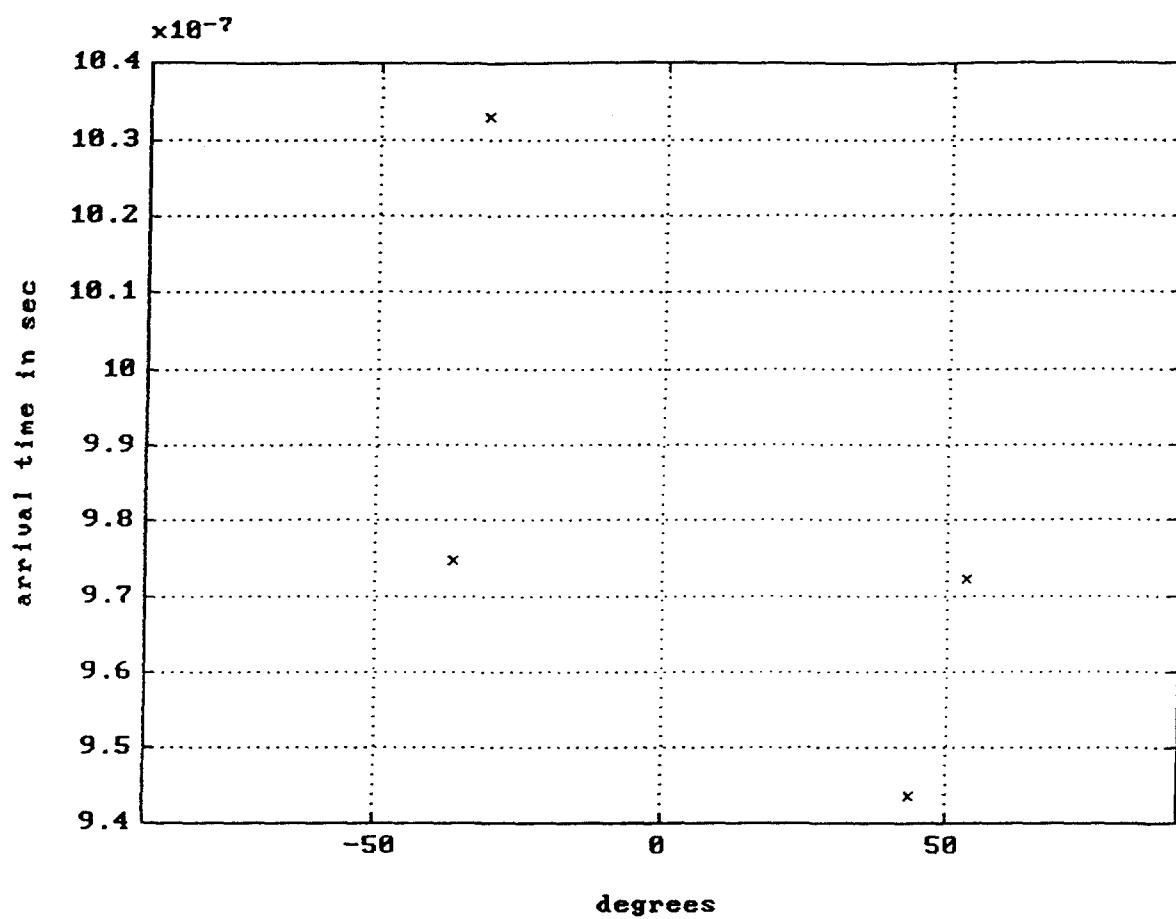


$d_1 = 100$  meters

$d_2 = 100$  meters

**FIGURE 4.9**



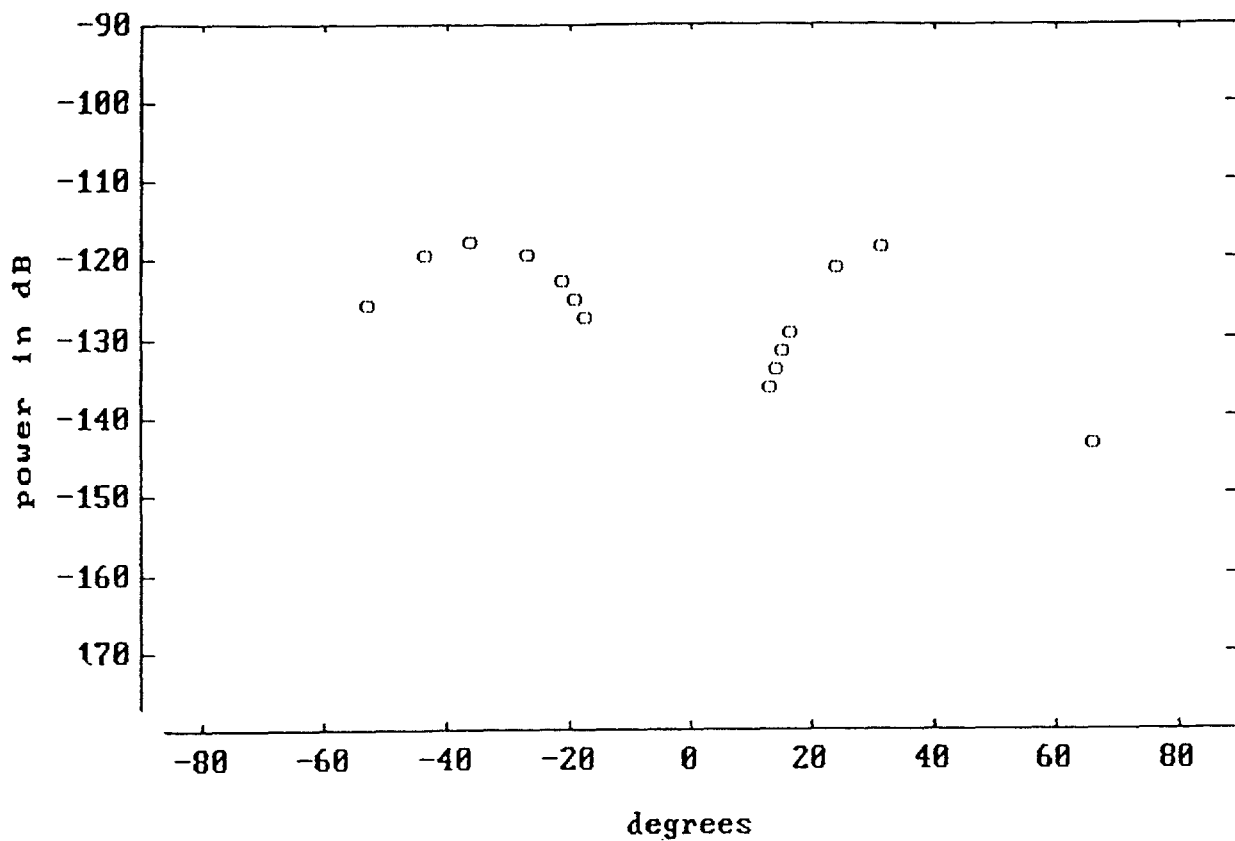


$d_1 = 100$  meters

$d_2 = 100$  meters

**FIGURE 4.10**



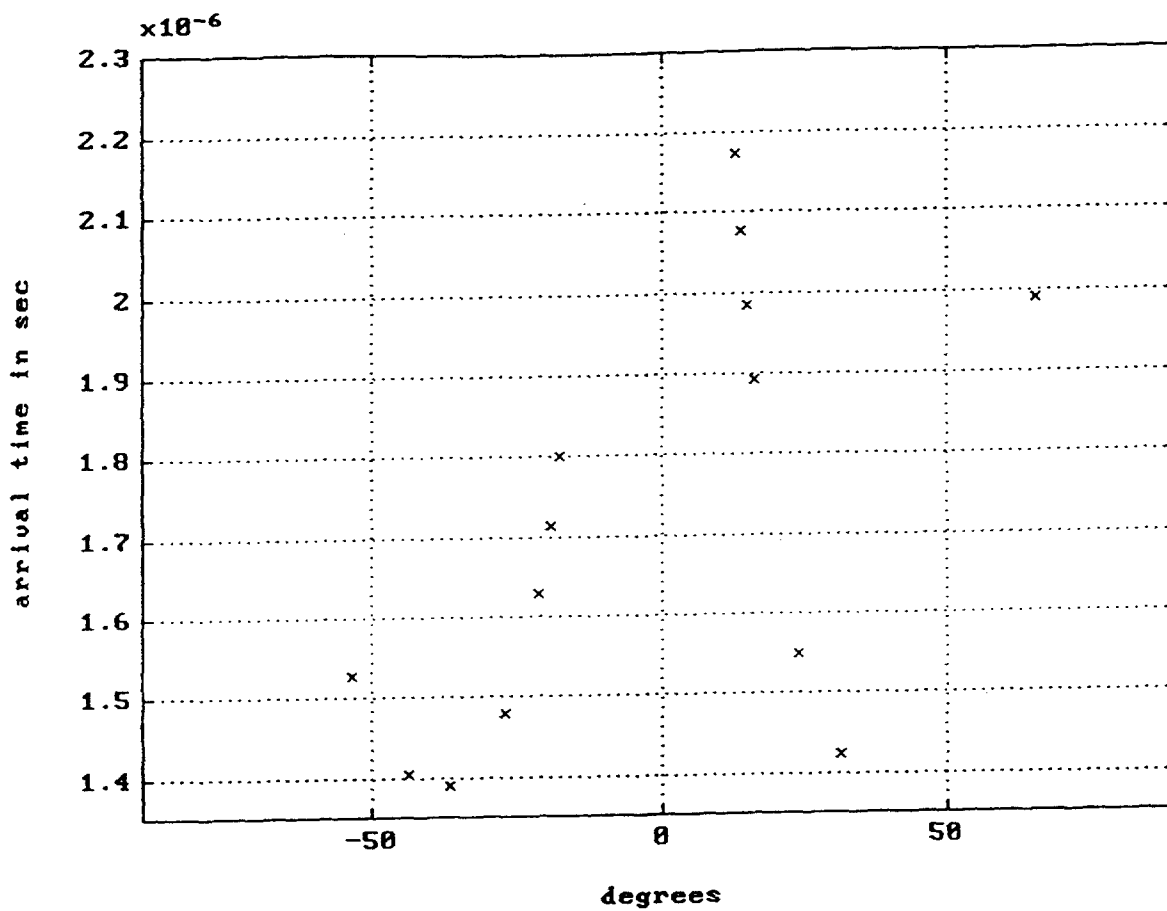


$d_1 = 100$  meters

$d_2 = 200$  meters

**FIGURE 4.11**



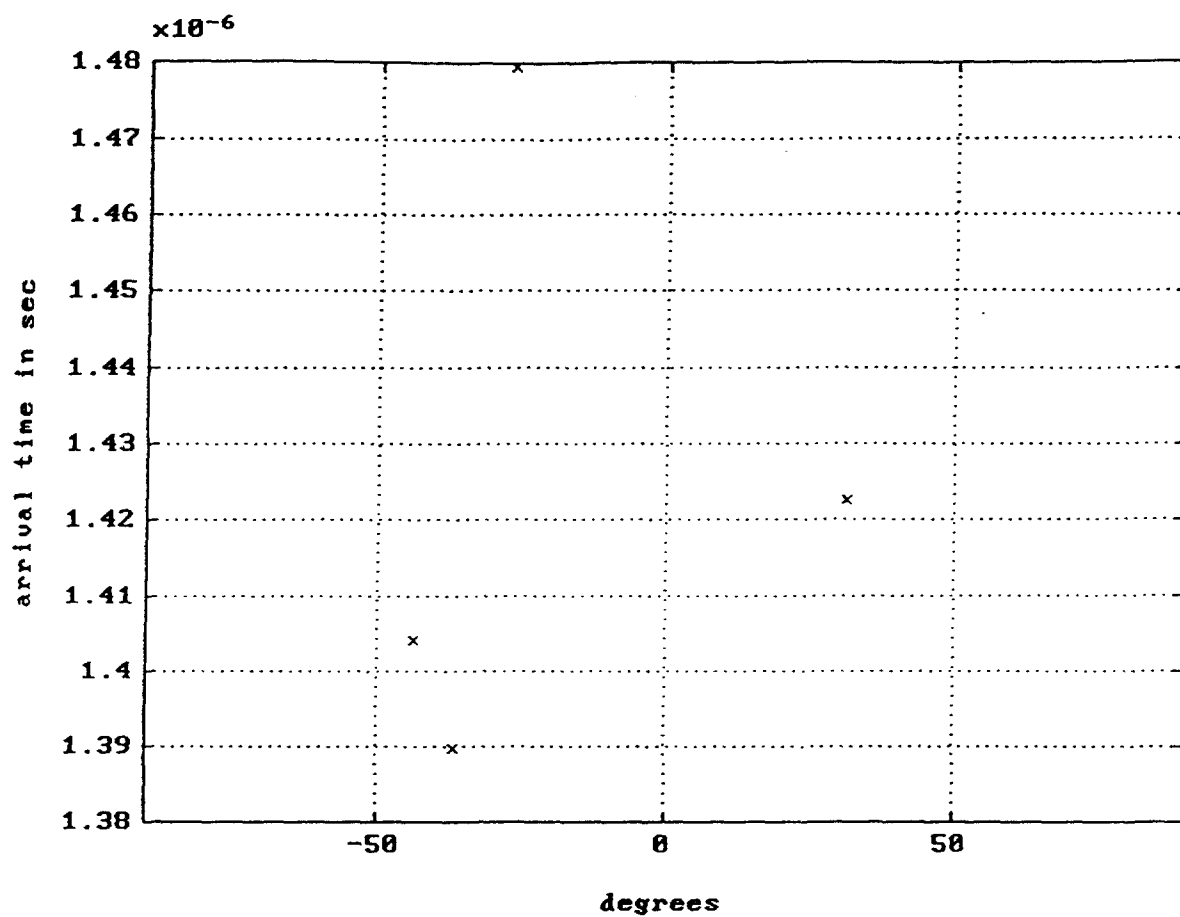


$d_1 = 100$  meters

$d_2 = 200$  meters

**FIGURE 4.12**



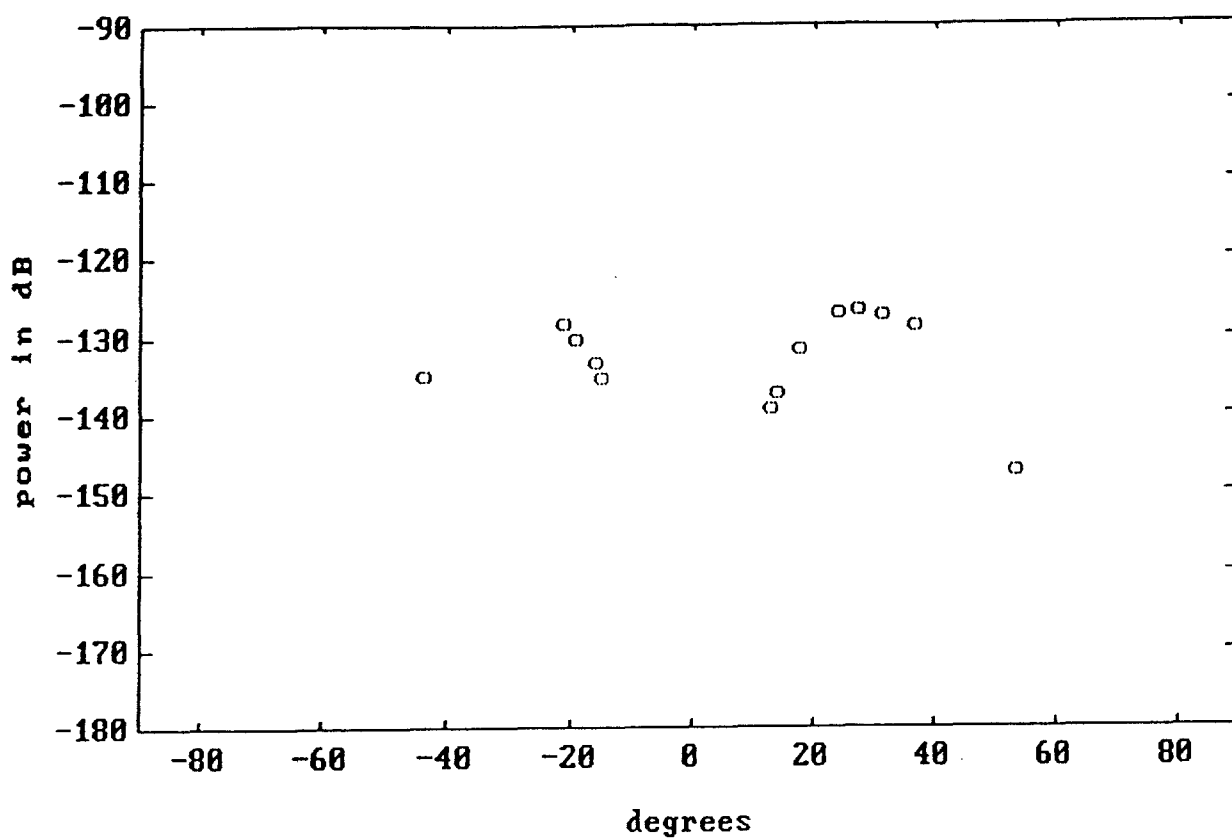


$d_1 = 100$  meters

$d_2 = 200$  meters

**FIGURE 4.13**



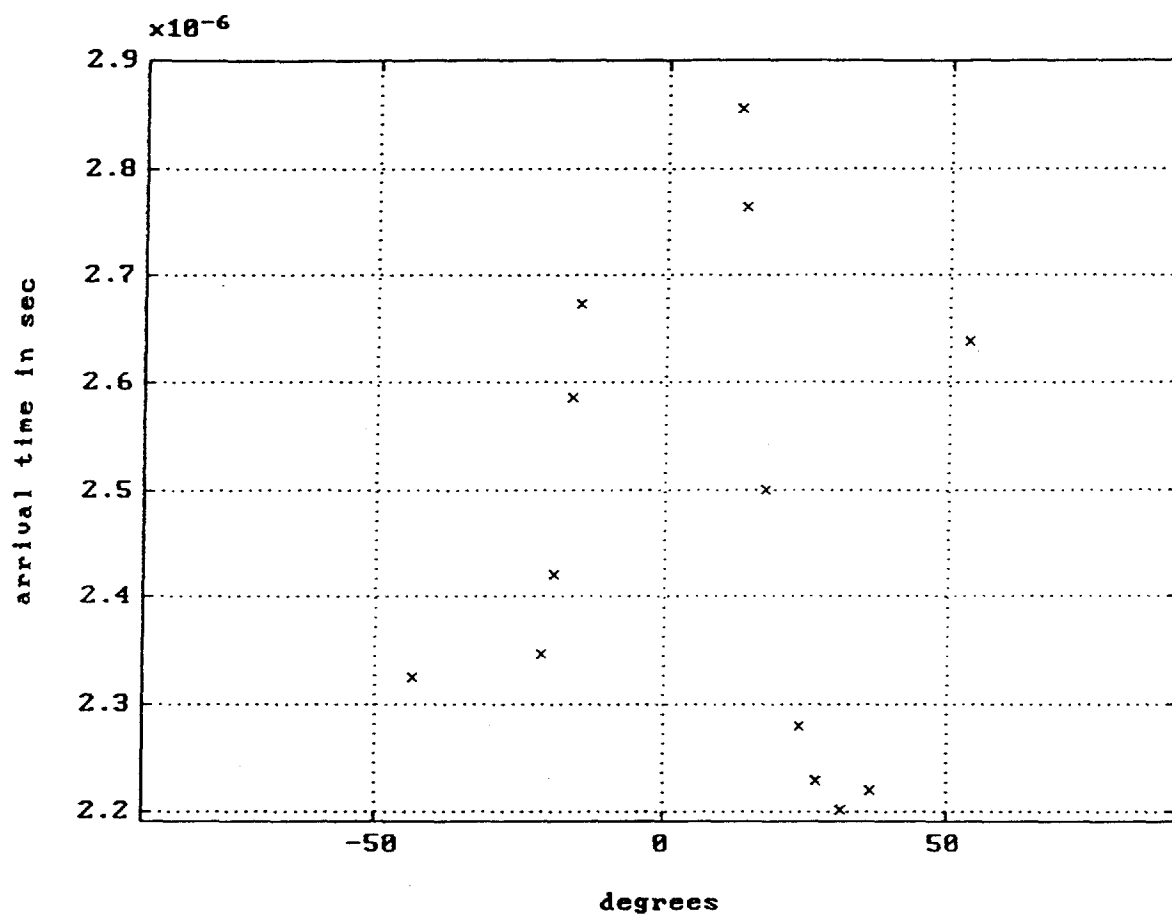


$d_1 = 100$  meters

$d_2 = 400$  meters

**FIGURE 4.14**





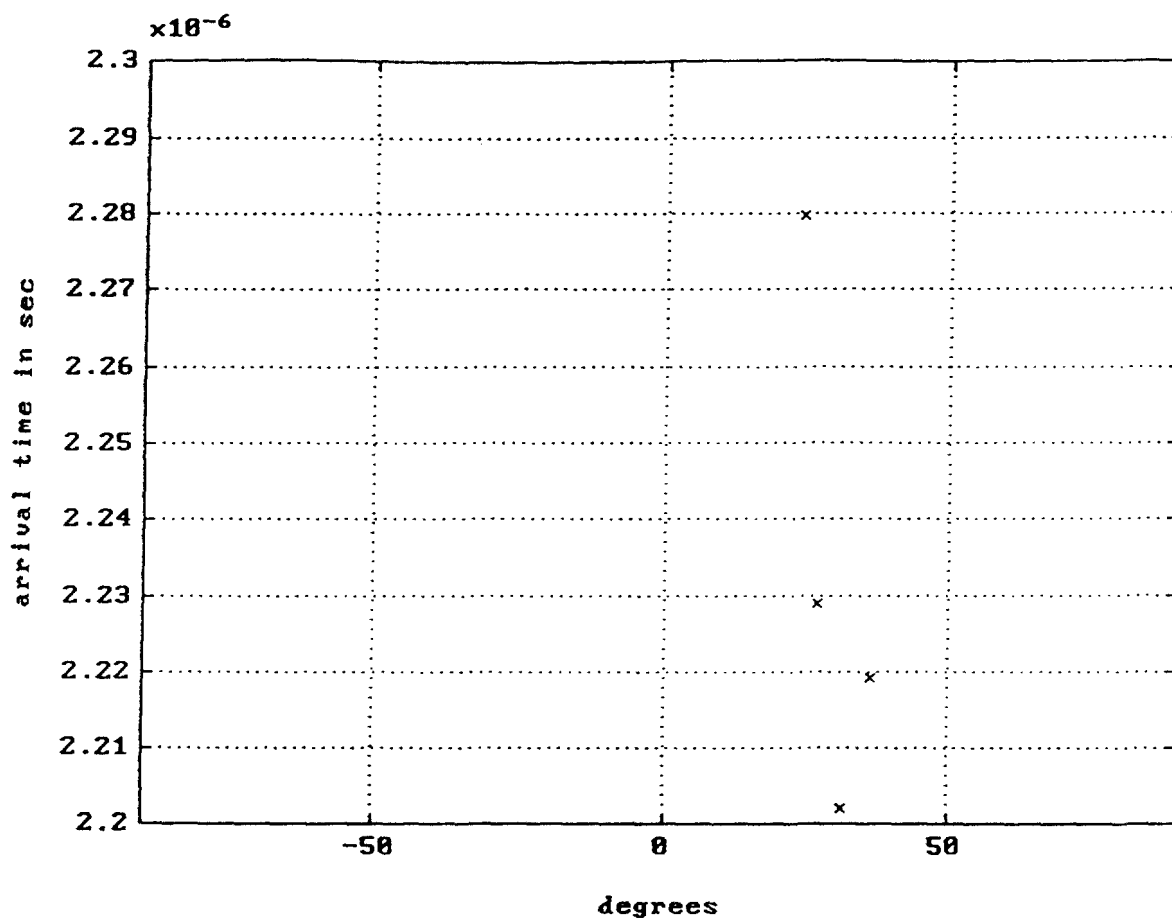
$d_1 = 100$  meters

$d_2 = 400$  meters

**FIGURE 4.15**





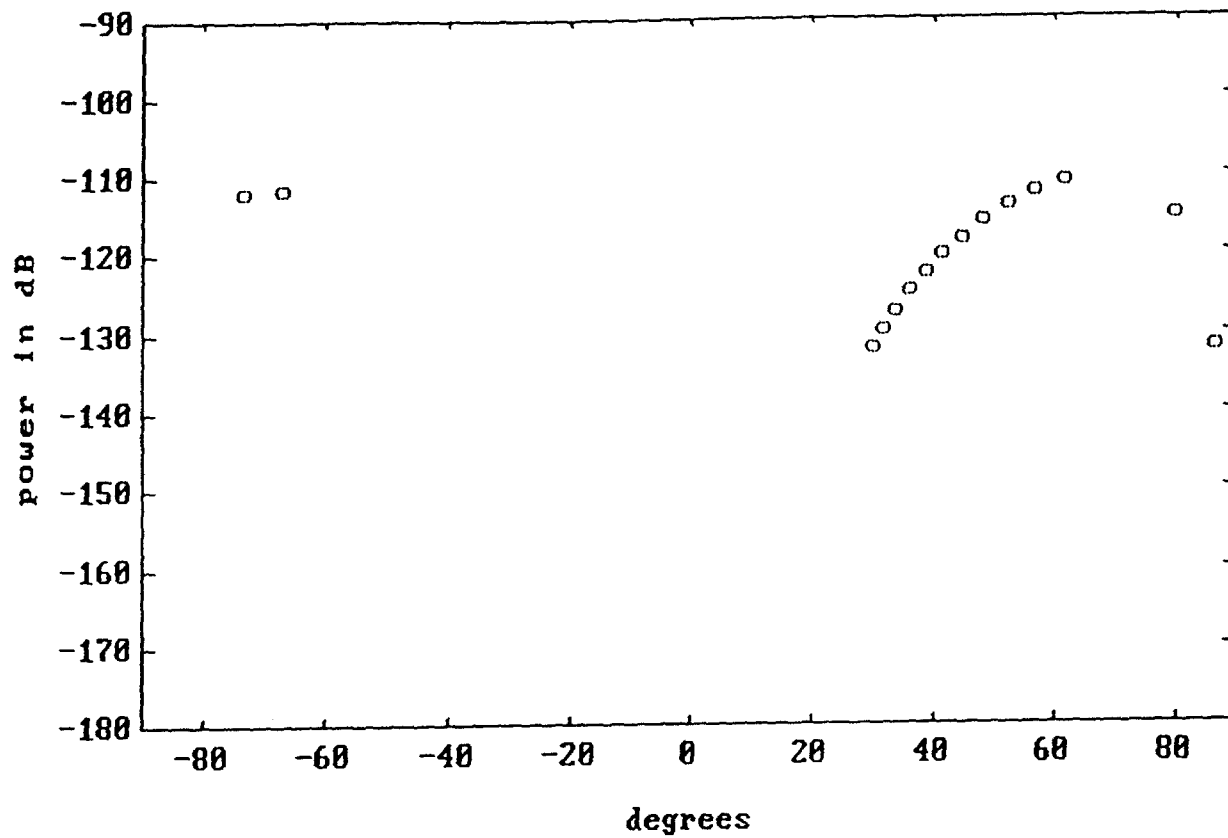


$d_1 = 100$  meters

$d_2 = 400$  meters

**FIGURE 4.16**



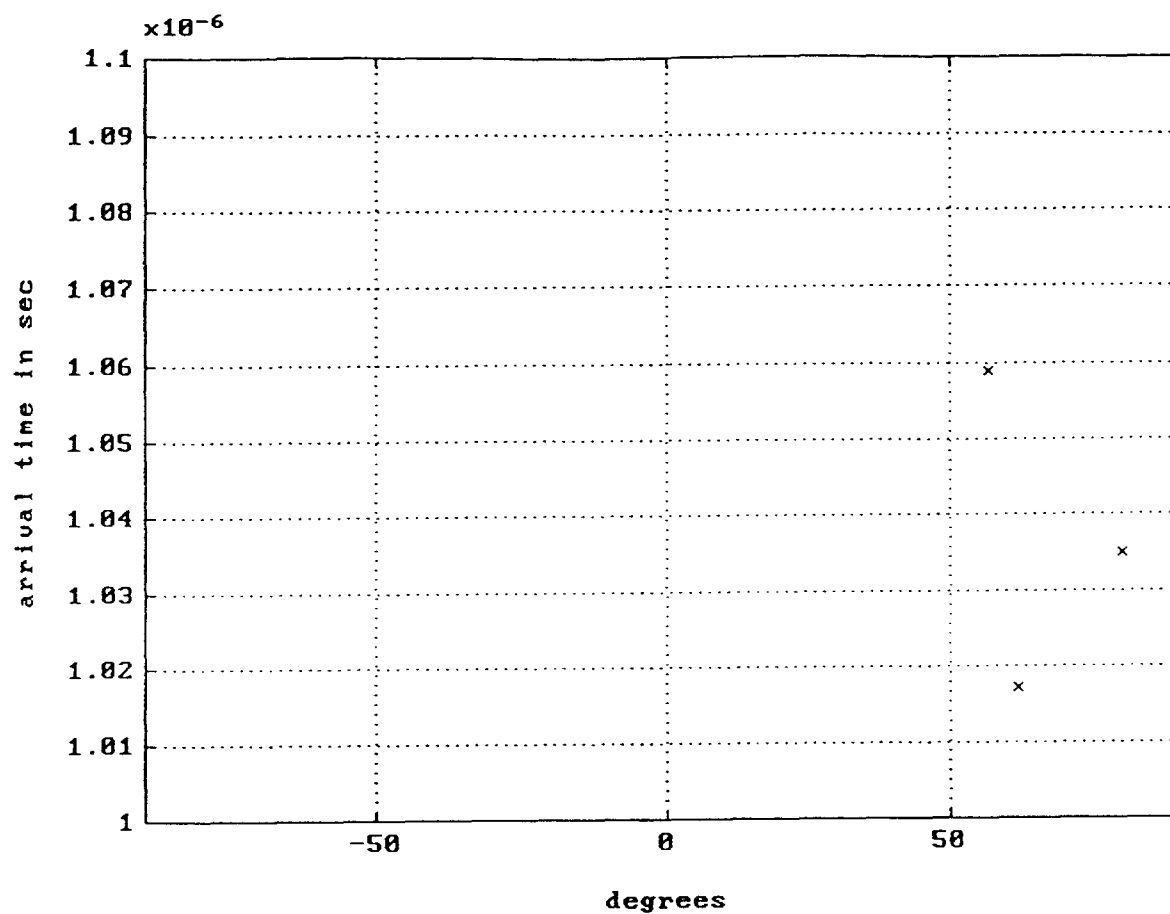


$d_1 = 250$  meters

$d_2 = 10$  meters

**FIGURE 4.17**



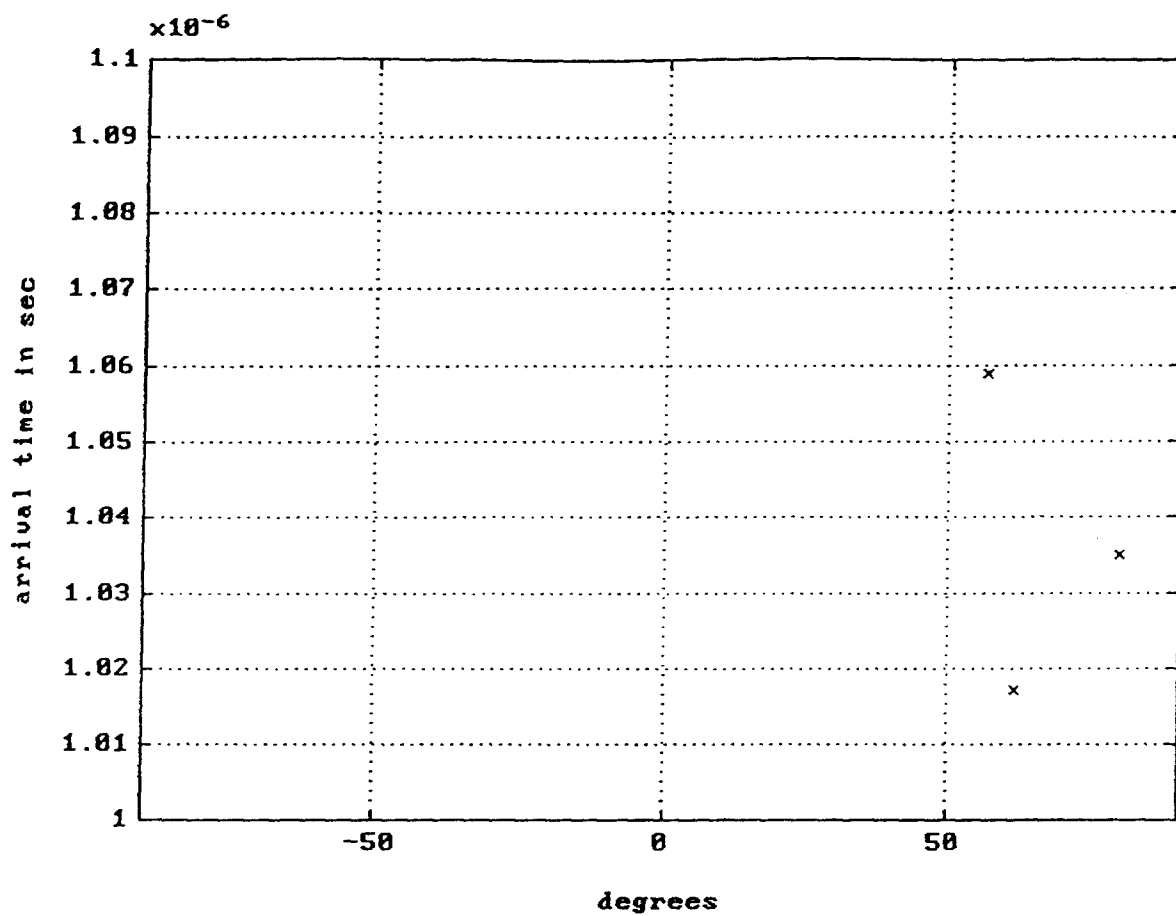


$d_1 = 250$  meters

$d_2 = 10$  meters

**FIGURE 4.19**



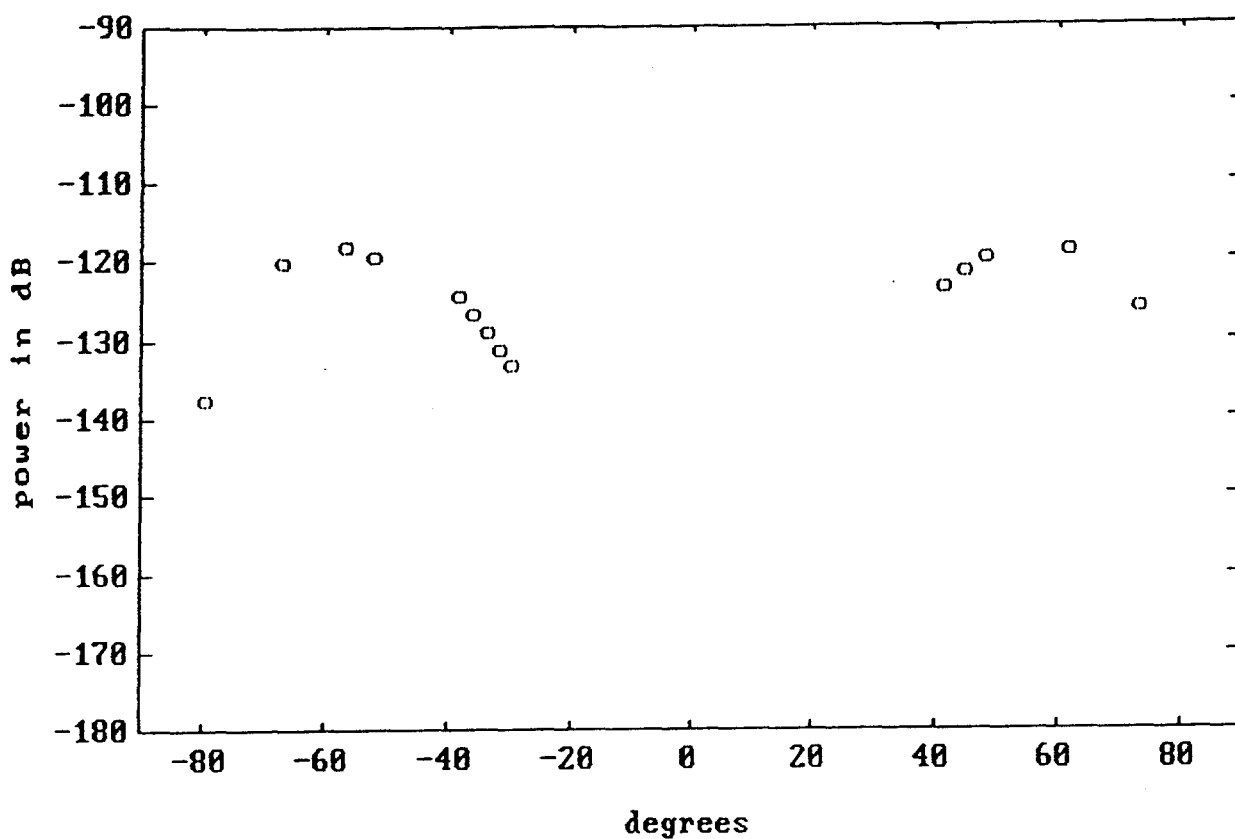


$d_1 = 250$  meters

$d_2 = 10$  meters

**FIGURE 4.19**



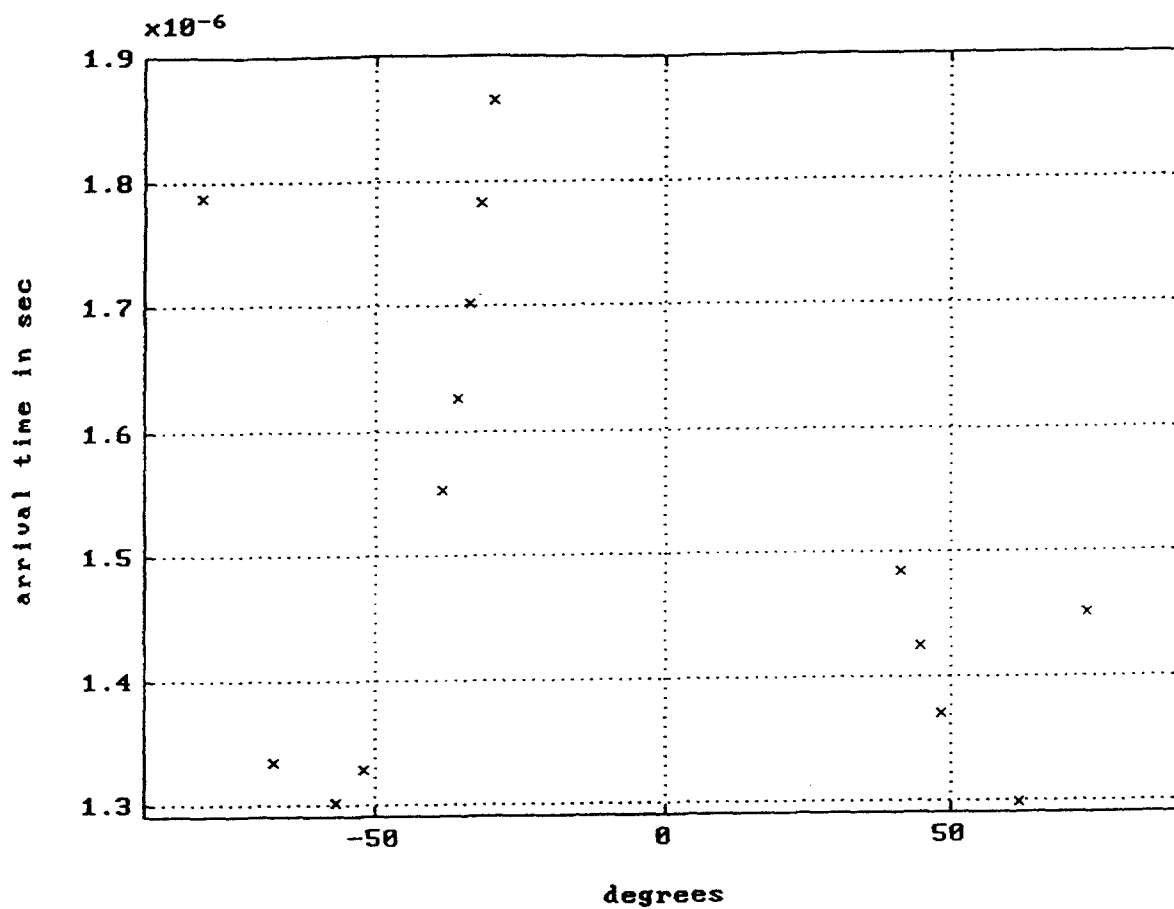


$d_1 = 250$  meters

$d_2 = 50$  meters

**FIGURE 4.20**



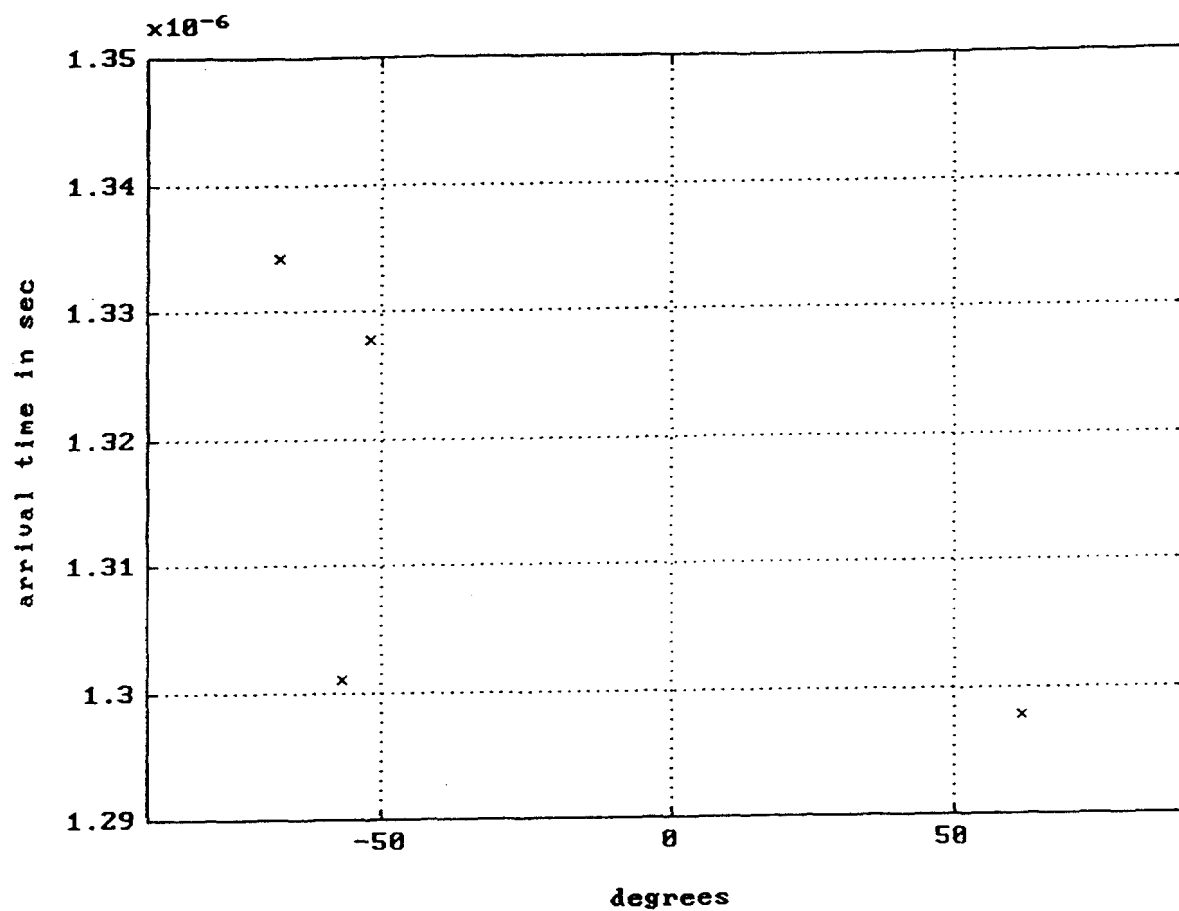


$d_1 = 250$  meters

$d_2 = 50$  meters

**FIGURE 4.21**



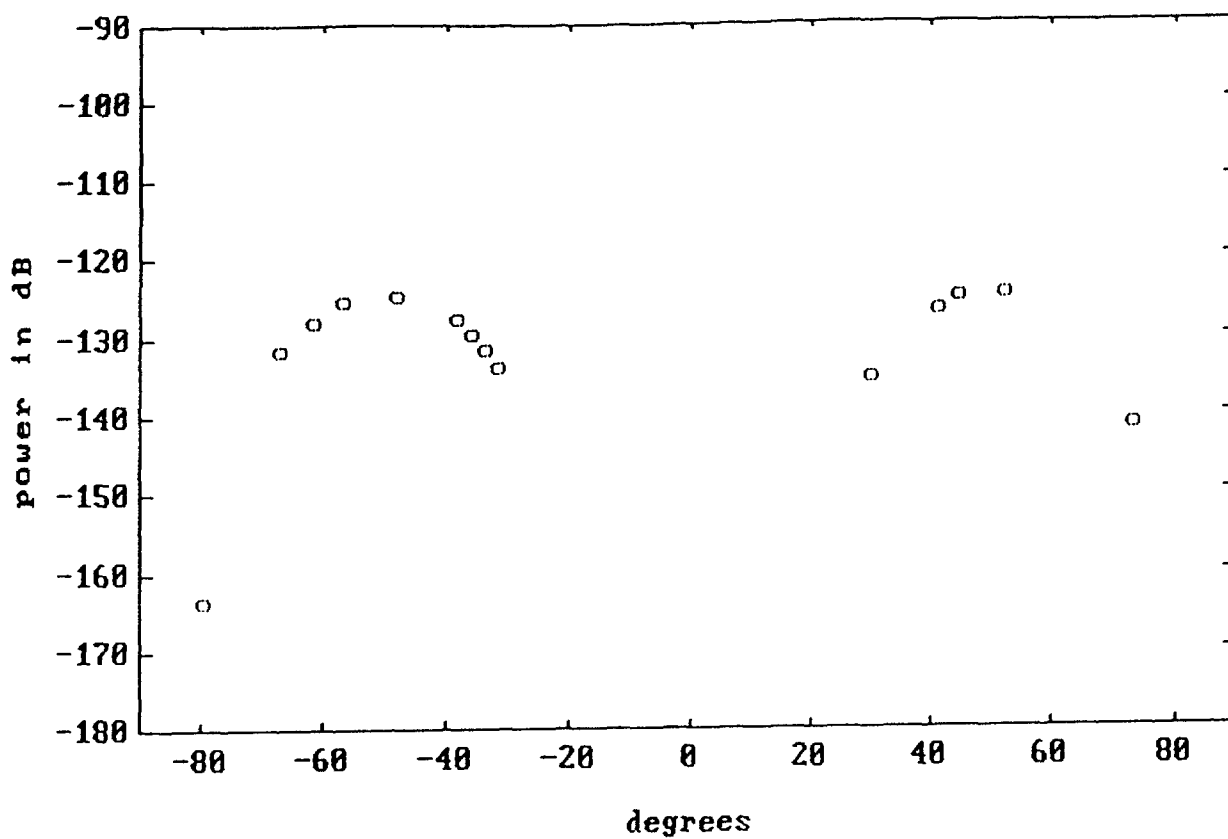


$d_1 = 250$  meters

$d_2 = 50$  meters

**FIGURE 4.22**





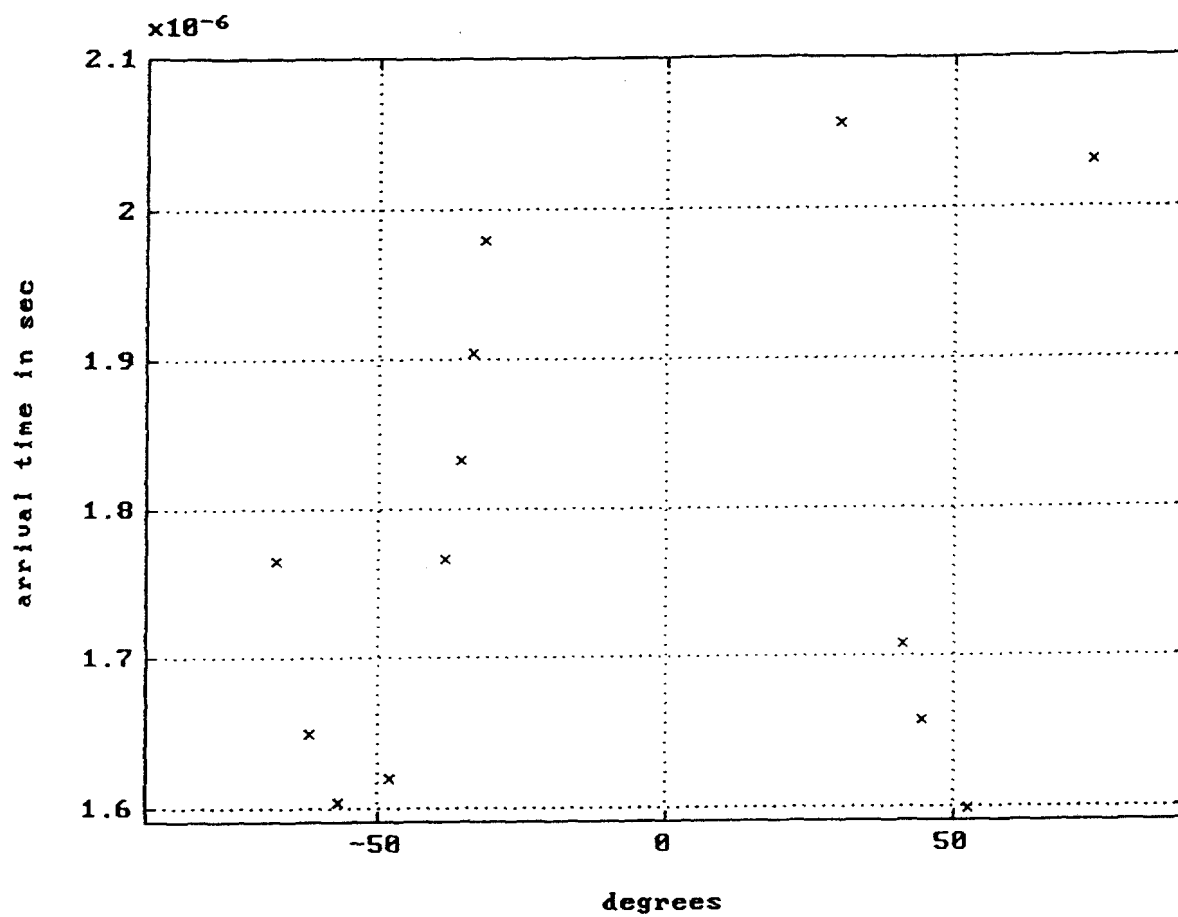
$d_1 = 250$  meters

$d_2 = 100$  meters

**FIGURE 4.23**





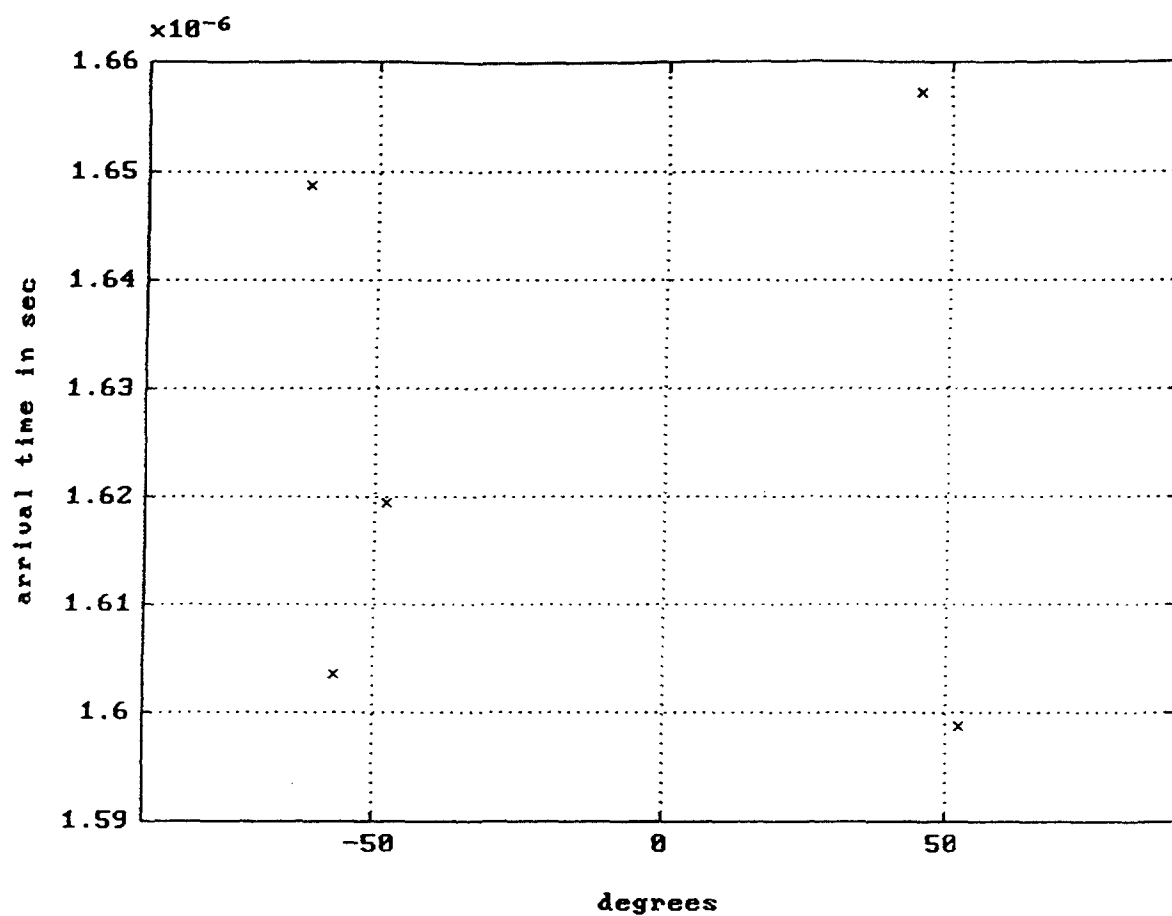


$d_1 = 250$  meters

$d_2 = 100$  meters

**FIGURE 4.24**



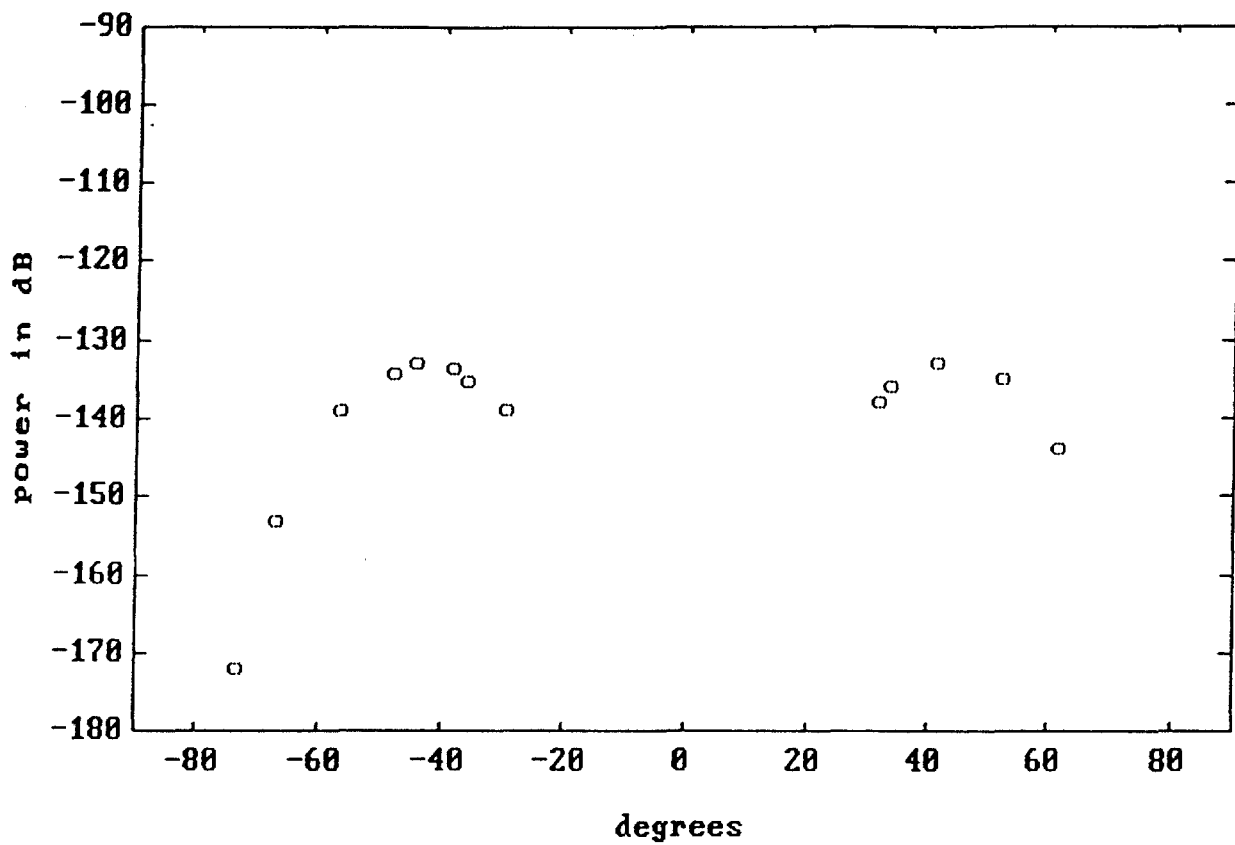


$d_1 = 250$  meters

$d_2 = 100$  meters

**FIGURE 4.25**



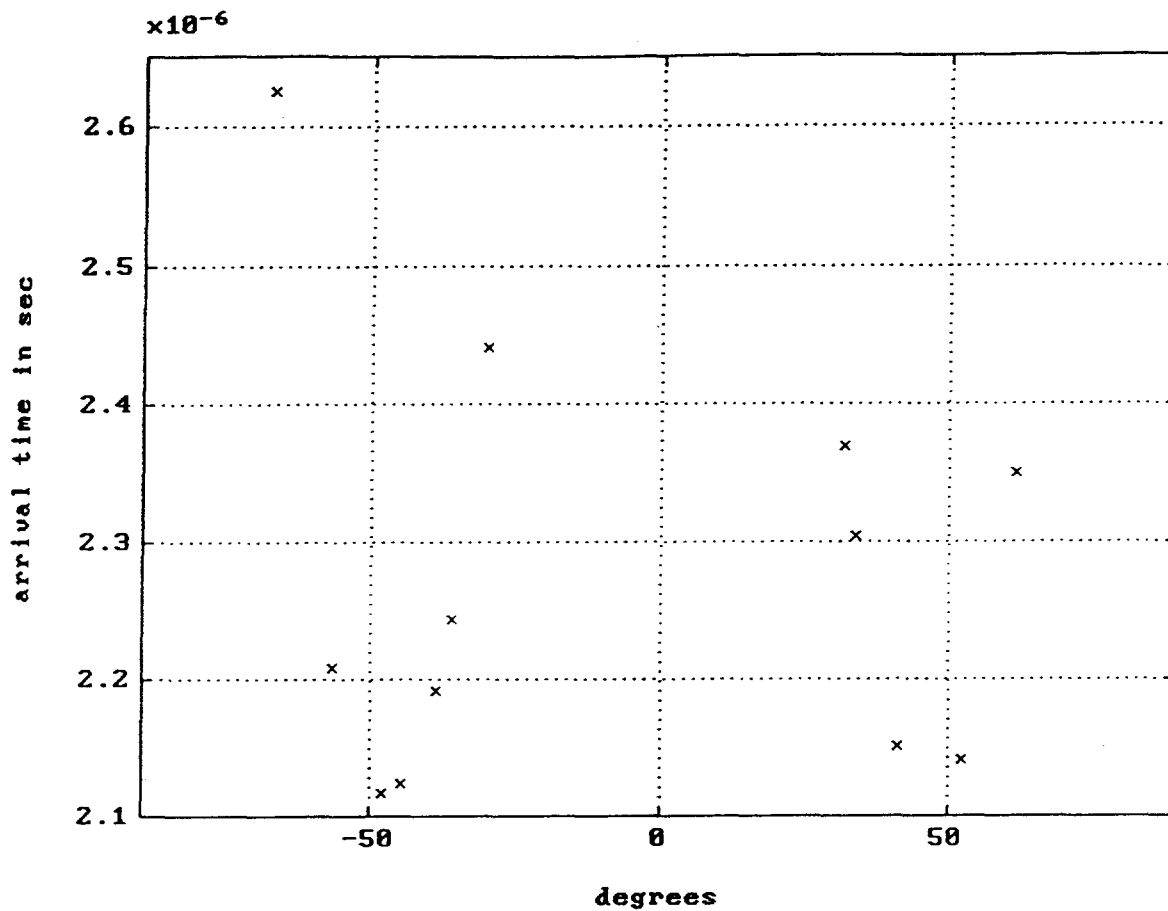


$d_1 = 250$  meters

$d_2 = 200$  meters

**FIGURE 4.26**



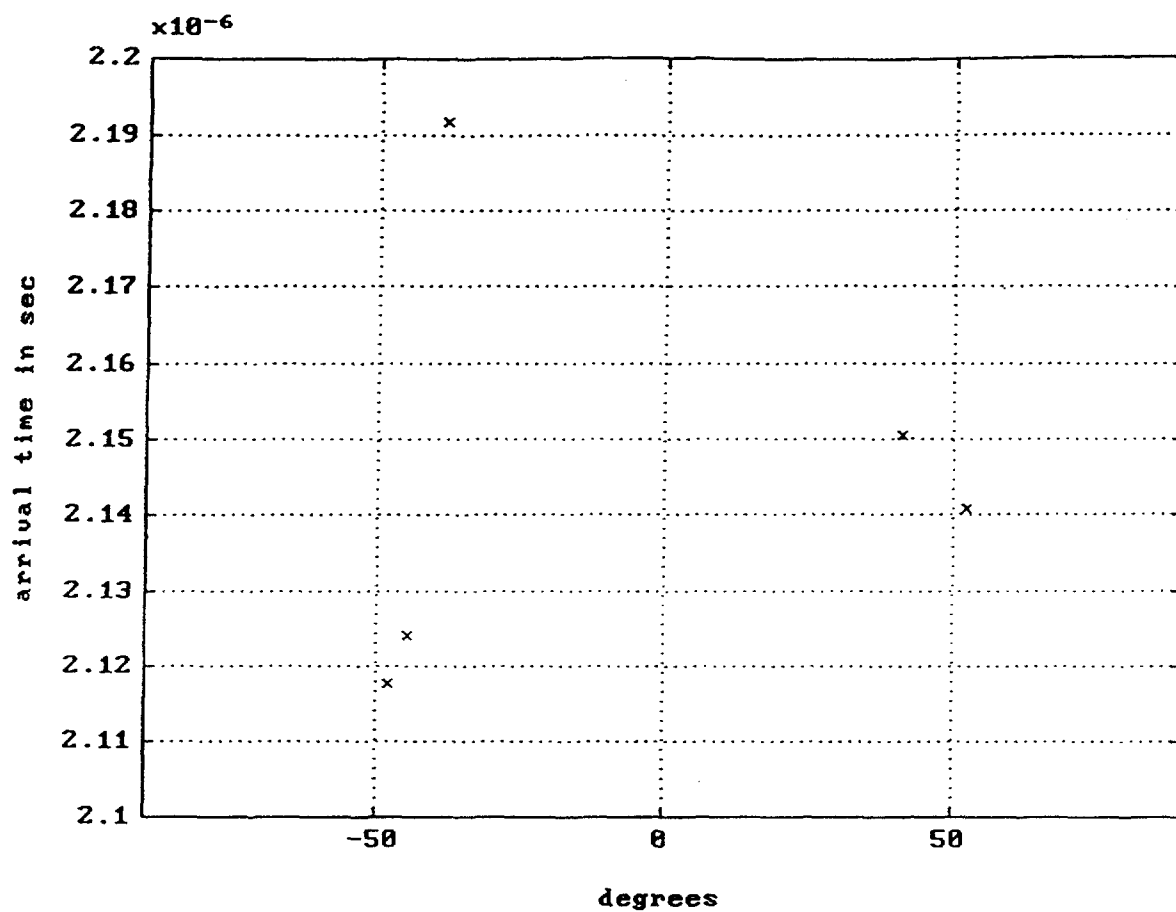


$d_1 = 250$  meters

$d_2 = 200$  meters

**FIGURE 4.27**



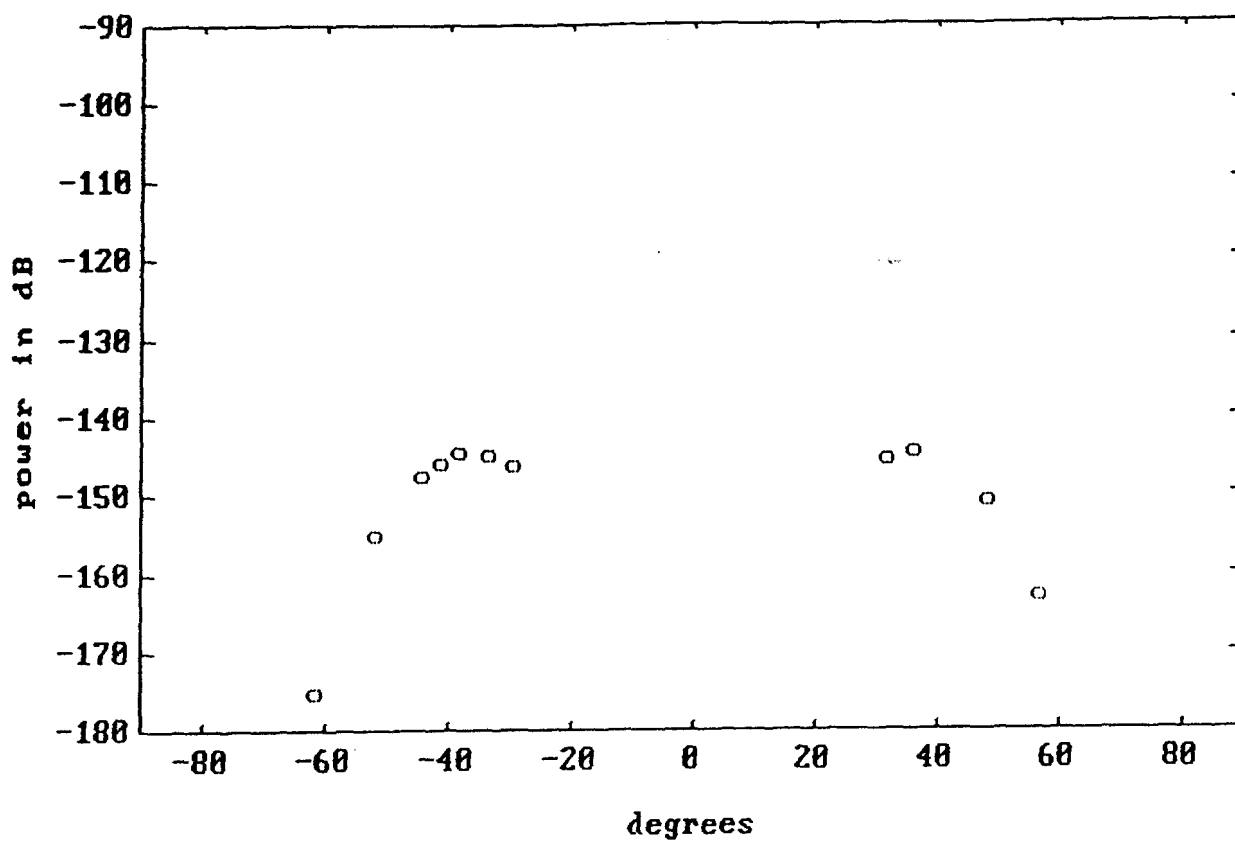


$d_1 = 250$  meters

$d_2 = 200$  meters

**FIGURE 4.28**



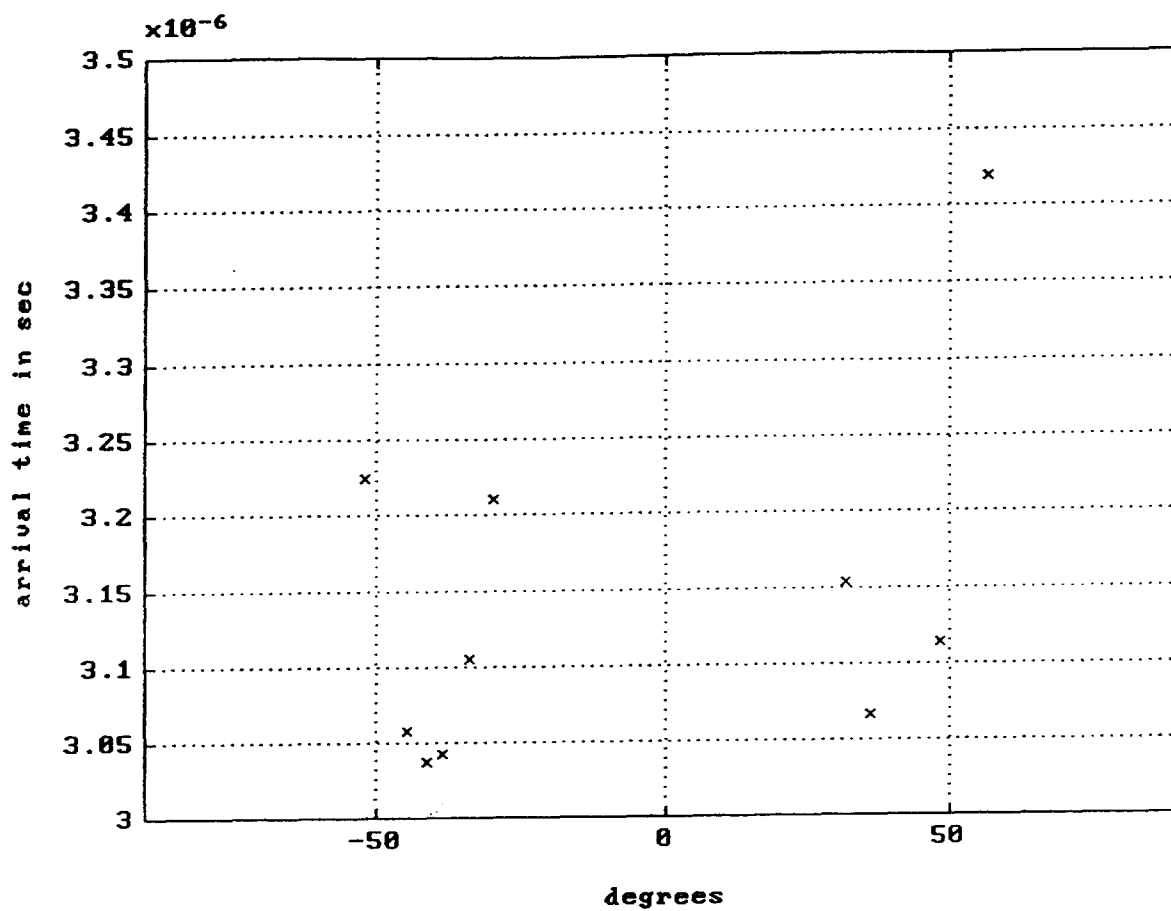


$d_1 = 250$  meters

$d_2 = 400$  meters

**FIGURE 4.29**



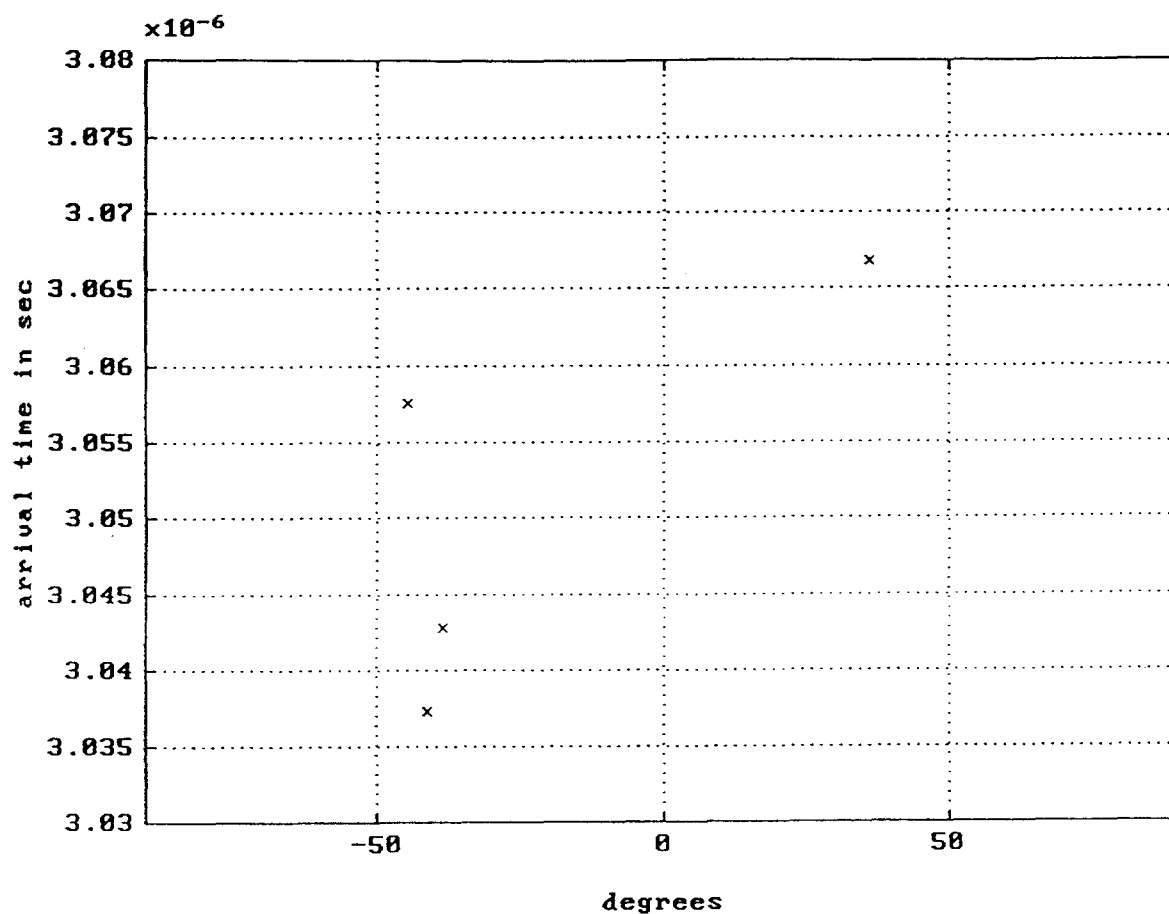


$d_1 = 250$  meters

$d_2 = 400$  meters

**FIGURE 4.30**





$d_1 = 250$  meters

$d_2 = 400$  meters

**FIGURE 4.31**





## 5.0 MEASUREMENT OF MULTIPATH IN OUT-OF-SIGHT COMMUNICATIONS

### 5.1 Introduction

In this experiment, a B-CDMA transmitter operating at a bandwidth of 48MHz was placed out-of-sight of a B-CDMA spread spectrum RAKE receiver. The system was then synchronized to one ray (or group of in-close rays) and the RAKE was used to display returns spaced 20ns apart up to  $\pm 2.5\mu\text{s}$  about the locked signal.

The results of these experiments are shown in Figs. 5.1 - 5.6. Figures 5.1 and 5.2 show the multipath. Note that two distinct multipaths are observed separated by 60 - 100ns.

Figure 5.3 shows a photograph with a  $\pm 2.5\mu\text{s}$  time spread of the output of the RAKE receiver. Note that there is no, strong, distant multipath signal seen. Figure 5.4 is an expanded view of Fig. 5.3. Similar results are shown in Figs. 5.5 and 5.6. Note, that since there is no significant multipath term beyond  $1\mu\text{s}$ , a RAKE receiver, used with a narrowband spread spectrum system will not provide improvement.